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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,431	02/09/2004	Naohiro Kamiya	Q79783	6593

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EXAMINER	
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ART UNIT	PAPER NUMBER
1731	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,431	KAMIYA, NAOHIRO	
	Examiner	Art Unit	
	Jason L. Lazorcik	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/11/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Saito (US 2003/0110803 A1).

The instant reference teaches the formation of texture on the polished surface of a glass disk using a texturizing tape (Figure 2, ¶[0016]). The glass substrate has a preferred composition (¶[0056-0066]) which reads directly upon the claimed composition set forth in claim 4. The substrate is subjected to the following required and/or optional processing steps;

Saltio teaches a processing with the following requisite and/or optional steps;

1. Polish the substrate to Ra < 0.2nm – see ¶ [0067 to 0074]
2. Scrub wash using an alkaline aqueous solution with sonication - ¶ [0075]
3. Chemically strengthen in molten Na / K salt bath
4. Optional scrub wash / Ultrasonic wash in alkaline aqueous solution – see ¶ [0077]

5. Texturing step with texture tape with optional alkali component- ¶ [0077-0083]
6. Tape wash with alkali washing solution - ¶ [0088-0090]
7. Scrub wash with alkali solution - ¶ [0091-0094]
8. Ultrasonic wash with alkali solution - ¶ [0095-0098]

As evidenced by Steps 2, 3, and 4 above, the prior art discloses at least three separate procedures between the substrate polishing (e.g. mirror-polishing) step and the texturing step. Where each of the three steps are performed with the use of "chemicals" each is deemed to read upon the claimed "chemical treatment step for the mirror-polished glass substrate".

Further, it will be appreciated by one of ordinary skill that strongly basic solutions particularly comprising sodium hydroxide result in the dissolution of silica to form sodium silicate or "water glass". The instant reference teaches the use of strongly basic washes (e.g. pH 10) in the exemplary processes set forth in Table 3 and points to the known use of sodium or potassium hydroxide solutions in analogous substrate processing techniques (Pg 1, ¶ [0010]). To this end, the reference teaches that it is known to add sodium or potassium hydroxide to "add a chemical action to the mechanical processing force". Although not explicitly disclosed in the Saito reference, it is the Examiners position, absent any compelling evidence to the contrary, that the scrub wash steps using an alkaline solution implicitly remove "at least a part of the polishing-affected layer as claimed".

Should Applicant contest this assertion, then it is the Examiners position that the use of an alkaline solution comprising sodium hydroxide would present no more than a merely obvious extension over the prior art teachings. Specifically, it would be obvoius to utilize a solution which provides a "chemical action" which compliments the scrubbing force in order to insure complete removal of the polishing abrasives and chemical strengthening reagents.

Finally, the disclosed chemical strengthening is understood to provide a tempered state through a process of ion exchange. During this process smaller ions are extracted from the surface of the glass and are replaced by larger ions from the molten salt solution. With this general understanding, the disclosed chemical strengthening process is understood to "remove at least a part" (e.g. surface ions) of the polished layer of the glass subsrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 2003/0110803 A1) as applied to claim 1 under 35 USC 102(b) above.

Regarding Claim 2, Sato fails to indicate the use of sodium hydroxide, potassium hydroxide, and or ammonium fluoride in a chemical treatment step. Saito does however teach that after polishing and prior to immersion in the chemical tempering it is highly desirable to wash residual slurry (polishing agent) from the disk surface. The reference continues by indicating that the washing step should make use of "an acidic aqueous solution or an alkaline aqueous solution and pure water". Aqueous solutions of both sodium hydroxide and potassium hydroxide are well known basic solutions to those of ordinary skill in the art. Since the subsequent chemical tempering step makes use of a mixed nitrate salts of both sodium and postassium, the use of one of the sodium or posassium hydroxide in the preceeding washing step would have been an obvous choice in order to minimize contamination of the tempering bath with different ions.

With respect to claim 5, Saito fails to explicitly recite a step of forming a magnetic layer upon the as fabricated glass disk, however the reference repeatedly indicates(e.g abstract) that said disk is intended for use as a

magnetic disk. It would have been readily evident to one of ordinary skill in the art of fabricating magnetic disks and hard drives to deposit a magnetic layer upon the Saito glass disk when using the disk in the recommended application as a magnetic disk.

Regarding the newly added limitation in claim 5 regarding the observed magnetic anisotropy and the newly added claim 6 which pertains to surface roughness in the circumferential vs. the radial directions of the glass substrate, Applicant is directed to the substantial similarity between the prior art process and Applicants own preferred embodiment.

Specifically, Applicants preferred embodiment is understood to provide preliminary polishing steps which yield a surface roughness, Ra, in the range of 300nm to 1 micron, a subsequent chemical strengthening step in potassium and sodium nitrate, a treatment in an alkaline sodium hydroxide solution. This treatment is followed by a texturing with polycrystalline diamond having an average 0.125 micron grain size wherein a 3.08 lb load is applied with a tape speed at 4.72 in/min.

Applicants preferred embodiment is contrasted with the prior art example which preliminarily polishes the substrate to Ra <0.25nm followed by chemical strengthening in a sodium/potassium nitrate salt bath and surface washing with an alkaline solution. Tape texturing is carried out with polycrystalline diamond with particle sizes in the range of 90 to 150nm with a load of 7 lbs and a tape speed of 3 inches/min. Texturing is followed by several alkaline washes, and it is

disclosed that the final Ra value can be in the range of 0.59 nm with no abnormal projections in the circumferential direction (see Example 4, Table 3).

The key point is that an analysis of the prior art process and Applicants preferred embodiments reveal substantially identical process conditions utilizing substantially identical reagents and processing techniques. Although the prior art does not explicitly quote the anisotropic figure or the surface roughness ratio, it is the Examiners position that these values would follow as a natural consequence of the prior art processing conditions absent any compelling evidence to the contrary. Alternatively, it is asserted that the claimed values would present no more than a matter of routine optimization for one having a normal level of skill in the art at the time of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 2003/0110803 A1) as applied to claim 1 under 35 USC 102(b) above.

Regarding Claim 2, Sato fails to indicate the use of sodioum hydroxide, potassium hydroxide, and or ammonium fluoride in a chemical treatment step. Saito does however teach that after polishing and prior to immersion in the chemical tempering it is highly desirable to wash residual slurry (polishing agent) from the disk surface. The reference continues by indicating that the washing step should make use of "an acidic aqueous solution or an alkaline aqueous solution and pure water". Aqueous solutions of both sodium hydroxide and potassium hydroxide are well known basic solutions to those of ordinary skill in the art. Since the subsequent chemical tempering step makes use of a mixed nitrate salts of both sodium and postassium, the use of one of the sodium or posassium hydroxide in the preceeding washing step would have been an obvous choice in order to minimize contamination of the tempering bath with different ions.

With respect to claim 5, Saito fails to explicitly recite a step of forming a magnetic layer upon the as fabricated glass disk, however the reference repeatedly indicates(e.g abstract) that said disk is intended for use as a magnetic disk. It would have been readily evident to one of ordinary skill in the art of fabricating magnetic disks and hard drives to deposit a magnetic layer upon

the Saito glass disk when using the disk in the recommended application as a magnetic disk.

Response to Arguments

Applicant's arguments filed 6/11/2007 have been fully considered but they are not persuasive.

Applicant acknowledges that Saito teaches the formation of circumferential texture on the polished surface of a glass disk using a texturing tape as claimed. Applicant further acknowledges that one of ordinary skill would reasonably have been lead to the use of sodium or potassium hydroxide in a chemical treatment step. However, Applicant then asserts that there is no suggestion or teaching that "the chemical treatment" disclosed in the prior art is used to "remove at least a part of the polishing-affected layer" prior to subjecting the disk to the texturing treatment.

Examiner is not persuaded.

Saltio teaches a processing with the following requisite and/or optional steps;

9. Polish the substrate to Ra < 0.2nm – see ¶ [0067 to 0074]
10. Scrub wash using an alkaline aqueous solution with sonication - ¶ [0075]

11. Chemically strengthen in molten Na / K salt bath
12. Optional scrub wash / Ultrasonic wash in alkaline aqueous solution – see ¶ [0077]
13. Texturing step with texture tape with optional alkali component- ¶ [0077-0083]
14. Tape wash with alkali washing solution - ¶ [0088-0090]
15. Scrub wash with alkali solution - ¶ [0091-0094]
16. Ultrasonic wash with alkali solution - ¶ [0095-0098]

The scrub wash utilizing an alkaline solution clearly reads upon the claimed "chemical treatment" step, so the question then centers upon the effectiveness of this treatment to "remove at least a part of the polishing-affected layer".

In paragraph [0010], Saltio teaches that it is known to utilize potassium hydroxide aqueous solution or a sodium hydroxide aqueous solution to add "a chemical action to the mechanical processing force". To this end, it is appreciated in the art that strongly basic solutions particularly comprising sodium hydroxide result in the dissolution of silica to form sodium silicate or "water glass". Therefore Saltio essentially teaches the use of strongly basic solutions during substrate processing (e.g. pH 10 as evidenced in Table 3) and likewise reveals that alkaline solutions comprising sodium or potassium hydroxide are known alkaline reagents in glass substrate processing.

Further, as pointed out in the previous office action, the chemical treatement in the pior art utilizes a molten bath of sodium and potassium ions, and it would logically follow that one of ordinary skill should utilize a sodium or potassium based reagents in preceeding/subsequent steps in order to minimize the potential for ionic cross contamination between process steps.

In summary, Saltio teaches a positive step of scrub washing the substrate with an aqueous alkali solution between the chemical strengthening step and the texturing steps. The use of an sodium or potassium hydroxide alkali solution would be readily evident for anyone seeking to add "chemical action to a mechanical processing force" in order to provide a more effective cleansing of the substrate while minimizing contamination potential.

Therefore, absent any compelling and unexpected evidence to the contrary, it is the Examiners position that the washing procedures disclosed in the prior art which utilize an alkaline aqueous solution either directly read upon the claimed "chemical treatment" step or alternately they render said step as a mere obvious extension when viewed in light of the prior art. Specifically, Applicant has provided no evidence that the process performed according to the prior art will not inherently result in the partial removal of the polishing affected layer. Additionally, it would be obvious to utilize an alkaline solution which results in the partial removal in order to insure thorough removal of contaminants between successive process steps.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

STEVEN P. GRIFFIN
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JLL